

Title: **GOME2-calibration:
 Calibration execution procedures**

Prepared by: L. van Riel

Checked by: M. Eschen

Verified by: J. Hopman

Authorised by: G. Otter

DISTRIBUTION LIST

Others	Copies	TPD	Copies
OG	1x	Archive	1x
R. Veratti		Calibration Execution Team	1x
B. Ricciarelli			
ESA	1x		
A. Lefèbvre			
J. Callies			

DOCUMENT CHANGE RECORD

Issue	Date	Number of pages	Short description	Pages
1	20 September 2000	1-23	First issue	All
2	11 March 2002		New document	All
3	16 August 2002	26	FM1 update	All
4	See header	See header	FM2 update	All

Table of Contents

1. SCOPE	5
2. DOCUMENTS AND ACRONYMS.....	6
2.1 APPLICABLE DOCUMENTS	6
2.2 REFERENCE DOCUMENTS	6
2.3 ACRONYMS	6
3. SUPPORTING PROCEDURES APPLICABLE DURING CALIBRATION EXECUTION.....	8
3.1 OPERATION AND HANDLING PROCEDURE.....	8
3.2 EMERGENCY PROCEDURE	8
3.3 ALIGNMENT PROCEDURE STIMULI AND MGSE	8
3.4 OPERATION OF TVC.....	8
3.5 SWITCH ON/OFF PROCEDURE FOR GOME2 (GAL ATP's)	8
3.5.1 Switch on procedure for Gome 2	8
3.5.2 Change_context.tal	10
3.5.3 History_decoder.tal	10
3.5.4 Switch off procedure for Gome 2	10
3.6 GOME2 CONSOLE	11
3.7 RUNNING ATP'S	11
3.8 LOGGING	12
3.9 BACK UP OF DAPB DATA.....	13
3.10 QUICK LOOK	13
3.11 LVM MONITORING.....	13
4. STEP-BY-STEP PROCEDURE	14
4.1 GENERAL	14
4.2 PREPARATIONS	15
4.3 AMBIENT BLOCK 1	15
4.4 AMBIENT BLOCK 2	15
4.5 INSTALL GOME2 IN TVC	16
4.6 TVC/GOME TB2 (NOMINAL TEMP) CAMPAIGN	16
4.6.1 Gome.....	16
4.6.2 LRS in White light mode.....	17
4.6.3 LRS in filter mode (TB2).....	17
4.6.4 LRS in slit mode (TB2).....	17
4.6.5 LRS in monochromator mode (TB2).....	17
4.6.6 HCL stimulus (TB2)	17
4.6.7 ORIEL stimulus (TB2).....	17
4.6.8 Zenith sky measurements (TB2)	18
4.6.9 Rad/Irrad in sun mode (TB2) and Sun simulator at nadir (TB2).....	18
4.6.10 Rad/Irrad in nadir mode (TB2) and Sun simulator at sun (TB2).....	18

4.6.11	Sphere in nadir (TB2).....	18
4.7	TVC/GOME TB1 (NOMINAL-10 TEMP) CAMPAIGN.....	18
4.7.1	LRS in white light mode (TB1).....	19
4.7.2	Oriel stimulus (TB1).....	19
4.7.3	HCL stimulus (TB1).....	19
4.7.4	Rad/Irrad in sun mode (TB1) and Sun simulator at nadir (TB1).....	19
4.7.5	Rad/Irrad in nadir mode (TB1) and Sun simulator at sun (TB1).....	19
4.8	TVC/GOME TB3 (NOMINAL+10 TEMP) CAMPAIGN.....	19
4.8.1	LRS in white light mode (TB1).....	20
4.8.2	HCL stimulus	20
4.8.3	Oriel stimulus (TB3).....	20
4.8.4	Rad/Irrad in sun mode (TB3) and Sun simulator at nadir (TB3).....	20
4.8.5	Rad/Irrad in nadir mode (TB3) and Sun simulator at sun (TB3).....	20
4.9	CATGAS MEASUREMENTS AT TB2	21
4.10	POST TEST AND PACKING.....	21
4.11	NON-CONFORMANCE REPORTING.....	22
4.12	DEVIATIONS FROM THE PROCEDURE	22
5.	PROCEDURE SIGN-OFF SHEET	23
6.	PROCEDURE VARIATION SHEET	24
7.	GOME 2 NCR'S AFFECTING CALIBRATION EXECUTION (GAL INFO)	25

1. Scope

This document presents the calibration execution procedure including the step-by-step procedure to be applied for the calibration of the Gome2 instrument.

This procedure is applicable for Gome2 FM1; FM2 and FM3

2. Documents and Acronyms

2.1 Applicable documents

- [AD1] Gome2 Calibration Requirements Specification
MO-RS-GAL-GO-0003
- [AD2] Gome2 Calibration Plan
MO-PL-TPD-GO-0004
- [AD3] Gome2 handling transportation and installation procedure
MO-PR-TPD-GO-0025, latest issue
- [AD4] Gome2 emergency procedure for the VCF
MO-PR-TPD-GO-0029, latest issue
- [AD5] Optical and mechanical alignment procedure
OPR020003
- [AD6] List of applicable Gome2 FMx instrument NCR's
(To be provided by GAL)
- [AD7] ATP report
MO-RP-TPD-GO-0037, latest issue
- [AD8] TVC user manual

- [AD9] Gome2 safety guideline for Calibration
MO-NT-GAL-GO-0025, latest issue

2.2 Reference documents

None

2.3 Acronyms

Acronym	Description
AIRR	Ambient Irradiance/Radiance set-up
ATP	Automated Test Procedure
BEPNT	ODBH Bus Probe, New Technology
CTB	Command and Telemetry Block
DAPB	Data Acquisition and Processing Block
EGSE	Electrical Ground Support Equipment
ESA	European Space Agency
FMUSIM	Fast Multiplexer Unit Simulator
FPA	Focal Plane Assembly
GAL	Galileo Avionica
Gome	Global Ozone Monitoring Experiment
GSE	Ground Support Equipment
HCL	Hollow Cathode Lamp
LRS	Low Radiance Stimulus
LVM	Low Voltage Mode
MGSE	Mechanical Ground Support Equipment
NCR	Non Conformance Report

Acronym	Description
OGSE	Optical Ground Support Equipment
PMD	Polarisation Measurement Device
PVS	Procedure Variation Sheet
QTH	Quartz Tungsten Hydrogen Lamp
SMU	Scan Mirror Unit
SLS	Spectral Light Source
TBC/TBD	To Be Confirmed / To Be Determined
TVC	Thermal Vacuum Chamber
VCF	Vacuum Calibration Facility
WLS	White Light Source
Xe	Xenon Lamp

3. Supporting procedures applicable during Calibration Execution

3.1 Operation and Handling Procedure

[AD3] Gome2 handling transportation and installation procedure
 MO-PR-TPD-GO-0025, latest issue

3.2 Emergency Procedure

[AD4] Gome2 emergency procedure for the VCF
 MO-PR-TPD-GO-0029, latest issue

3.3 Alignment Procedure Stimuli and MGSE

[AD5] Optical and mechanical alignment procedure
 OPR020003

3.4 Operation of TVC

[AD8] TVC user manual

3.5 Switch on/off procedure for Gome2 (GAL ATP's)

3.5.1 Switch on procedure for Gome 2

step	description
	turn 19" rack on
1.	set red switch to OFF (0)
2.	turn safety button at the bottom of the rack to the right
3.	turn on switch that is located directly above the safety button (should be directed upwards now)
4.	turn red switch to ON (1)
	boot up the BEPNT
5.	push the power button on the rightmost PC (located under the desk)
6.	login as 'administrator'
7.	double-click icon 'start_bep.bat'
8.	double-click icon 'BEP MMI'
9.	wait for red indicators in the application window to become green
10.	check all "acquiring panel" checkboxes to ON
	boot up FMUSIM
11.	push the power button on the leftmost PC (located under the desk)
12.	login as 'administrator'
13.	double-click icon 'FMU SIM MMI' (ignore error message "FMU SIM Core not present" --> OK)
14.	Start from menu bar: 'menu' --> 'core' --> 'start FMUSIM' (you have to click 'OK' twice)
15.	Start from menu bar: 'menu' --> 'core' --> 'connect to FMUSIM'
16.	in the application window, section 'panel', subsection 'input', click 'nominal 2'
17.	in the application window, section 'panel', subsection 'output', click 'nominal 1'
18.	in the application window, section 'panel', subsection 'commands', click 'acquisition on'

step	description
19.	in the application window, section 'panel', subsection 'commands', click 'distribute on'
	check 19" rack
20.	all numbers in the digital displays should be close to zero
	boot up CTB
21.	push the power button on the PC (located under desk)
22.	login as 'administrator',
23.	double-click icon 'GOME2 CTB_MMI'
24.	user: 'TPD_operator' ; working dir: 'GOME2FM2'
25.	Start from menu bar: 'menu' --> 'modes' --> 'online' → 'yes'
26.	Start from menu bar: 'menu' --> 'tools' --> 'ATP' --> 'start'
	Checksum control
27.	Switch N and ICU on buttons on power supply (19" rack) on
28.	Switch on Gome with ATP "Power_on28"
29.	Run ATP "Low_level_p_d_c"
30.	Input: Operator name (use your initials for this) → 'OK'
31.	Switch Off Gome with ATP "Power_supply_off"
32.	Control the values of the checksums in the ATP trace file, refer to [AD9]
33.	Switch on Gome with ATP: 'Og_start' (no parameters) (Og_start will now appear in ATP status window: should be yellow now, i.e. the ATP is waiting)
34.	Input: N and ICU on buttons on power supply → 'yes'
	19" rack
35.	push buttons 'EQ ON' and 'ICU ON' lift cap, push button, close cap (do nothing if buttons are already green)
36.	ICU display should read: +/- 28.00 V +/- 0.43 A
37.	EQT display should read: +/- 28.00 V +/- 0.00 A
38.	Wait for approximately 1 minute
	CTB
39.	Input: Operator name (use your initials for this) → 'OK'
40.	Input: Context_FPA_cooling_enabled (y/n) → 'n' (safe mode) → 'OK' Be sure about yes (FPA vacuum on!). Remark: use the console ATP for switching on FPA/PMD coolers
41.	Input: Context_PMD_cooling_enabled (y/n) → 'n' (safe mode) → 'OK' Be sure about yes (in vacuum only!)
42.	Input: Context_PMD_flight_line_enabled (y/n) → 'n' (safe mode) → 'OK'
43.	Input: Context_QTH_high_current_enabled (y/n) → 'n' (=360 mA); 'y' (=420 mA TBC) → 'OK'
44.	Input: Continue with BIT (y/n) → 'n' → 'OK' BIT = Built In Test, this procedure does not work properly, results always in a failure, use checksum procedure mentioned above instead
45.	Input: Choose monitoring (see log msg): 0,1,2 → '0' → 'OK'
46.	Input: Choose mon.par set (0=air, 1=TV) → air or TV → 'OK' Use the appropriate parameter for the environment Gome is in
47.	Input: ATP 'Get_packet' in ATP status window. From the options 1=RTR, 2=RT, 3=RTE, select option 3 (i.e. everything)
48.	Send Idle command (y/n) → 'y' → 'OK'

step	description
	DAPB
49.	push the power button on the DAPB (below desk)
50.	login and password are not needed
51.	double-click icon 'GOME-2 DAPB Version 1.xx'
52.	verify/set values in the DAPB start-up window: Station type: DAPB-1 Instrument model: FM1 (1, 2 or 3) Level: INSTRUMENT Company: TPD User: EZ Session description.: short description of measurement, this description will appear in data file name
	The subsystems are now ready for running calibration ATPs

3.5.2 Change_context.tal

A GAL ATP for switching on/off FPA and PMD coolers. Use preferably the console.tal

3.5.3 History_decoder.tal

An GAL ATP for resetting the history decoder. This ATP is used for monitoring anomalies. This ATP shall be frequently executed (at least after each ATP)

3.5.4 Switch off procedure for Gome 2

step	description
	shut down CTB
1.	start ATP 'OG_stop' (menu bar: 'menu' --> 'tools' --> 'ATP' --> 'start')
2.	wait for all ATP's to be stopped
3.	set CTB to local mode: ('menu' --> 'modes' --> 'local')
4.	exit CTB application: ('menu' --> 'file' --> 'exit')
5.	shutdown CTB computer (power switch under the desk)
	turn off 19" rack
6.	set red switch to OFF (0)
7.	turn OFF the switch located directly above the big red safety button (should be directed downward now)
8.	turn big red safety button to the left
	shut down FMUSIM
9.	stop FMUSIM core ('menu' --> 'core' --> 'stop FMUSIM core' ; OK)
10.	close FMUSIM application ('menu' --> 'file' --> 'close program')
11.	shutdown FMUSIM computer (power switch under desk)
	shutdown BEPNT
12.	close BEPNT application ('menu' --> 'file' --> 'exit')
13.	shutdown BEPNT computer (power switch under desk)

3.6 Gome2 console

This feature comprises initialisation/de-initialisation commands for Gome2, such as: FPA/PMD coolers on/off, set SMU angle etc.

The following procedure/settings are applicable (TBC):

1. Start Gome2_console.atp (see section 3.7)
2. Enter SMU angle [°]
3. Enter code for:
 - 200 Gome2 LED FPA off
 - 201 Gome2 LED FPA on
 - 300 Gome2 LED PMD off
 - 301 Gome2 LED PMD on
 - 400 Gome2 SLS off
 - 401 Gome2 SLS on
 - 500 Gome2 WLS off
 - 501 Gome2 WLS on
 - 600 Gome2 FPA cooler off
 - 601 Gome2 FPA cooler cold
 - 602 Gome2 FPA cooler disable
 - 603 Gome2 FPA cooler enable
 - 699 Set target temperature FPA [K]
 - 700 Gome2 PMD cooler off
 - 701 Gome2 PMD cooler cold
 - 702 Gome2 PMD cooler disable
 - 703 Gome2 PMD cooler enable
 - 704 Gome2 PMD cooler line 1 ground (do not use)
 - 705 Gome2 PMD cooler line 2 in-flight
 - 800 Set integration time (closest to Gome2 values is chosen) for FPA/PMD
 - 900 Close Gome2 Shutter (sun port)
 - 901 Open Gome2 Shutter
 - 902 Shutter Gome2 disable
 - 903 Shutter Gome2 enable
 - 998 Gome 2 in stand-by (idle) mode
 - 999 End

3.7 Running ATP's

For information concerning ATP's (i.e. structure, settings etc) reference is made to [AD7].

step	description
1.	Start from CTB menu bar: 'menu' --> 'tools' --> 'ATP' --> 'start'
2.	select ATP; enter 'Y'; click 'OK'

List of applicable measurement ATP's (For information only!):

ATP FM1	OGSE	MGSE	port	TB	TD
AETA.tal	LRS	AETA	NADIR	ambient	TD1
AIRR.tal	SunSim	AIRR	SUN	ambient	TD1
BREWSTERSCAN.tal	LRS	TVC	NADIR	TB123	TD1
FILTER.tal	LRS	TVC	NADIR	TB2	TD1
IFOV_.tal	LRS	TVC	NADIR	TB2	TD1
FELRAD.tal	FEL	TVC	NADIR	TB123	TD1
FELIRR.tal	FEL	TVC	SUN	TB123	TD1
SUNRAD.tal	SunSim	TVC	NADIR	TB123	TD1
SUNIRR.tal	SunSim	TVC	SUN	TB123	TD1
LINEARITY.tal	INT-LED	TVC	NA	TB2	TD12
MONITOR.TAL	INT-LED	TVC/AETA/AIRR	NA	TB123	TD12
MONITOR.TAL	INT-WLS	TVC/AETA/AIRR	NA	TB123	TD12
MONITOR.TAL	INT-SLS	TVC/AETA/AIRR	NA	TB123	TD12
DIFFUSERMON.TAL	INT-SLS	TVC	NA	TB2	TD1
ORIEL.tal	LRS	TVC	NADIR	TB123	TD1
MONOSCAN_.tal	LRS	NA	NADIR	TB2	TD1
HCL.tal	SLS-RAD	TVC	NADIR	TB123	TD1
SPHERE.tal	SPHERE-IRR	TVC	SUN	TB2	TD1
SPHERE.tal	SPHERE-RAD	TVC	NADIR	TB2	TD1
ZENITH.tal	ZENITH	TVC	NADIR	TB2	TD1

Note: This list can be changed throughout the calibration campaign

3.8 Logging

Logging shall be applicable during the calibration campaign. The following log forms shall be used:

1. Hand written Log (free format)
2. Electronic Log (predefined format)
3. Measurement Log (tracking of measurements, i.e. ATP's), excerpt of the electronic log

Parameters to be frequently monitored and to be logged:

parameter	value	remark
Instrument SLS voltage	220±5V	check Low Voltage Mode
Instrument SLS scan mirror angle	13°	FM
Instrument WLS current	Typical 360 mA	
Instrument temperature	FPA's PMD's Tref	Tref = Pre-disperser Prism Temperature
LRS SLS voltage	220±5V	check Low Voltage Mode
Sun simulator output stability during AIRR	±10% (TBC)	check output detector
TVC cold finger temperature	< -180°C	
TVC pressure	<1x10 ⁻⁵ mbar	At <1x10 ⁻⁴ mbar automatic switch-off of instrument
FPA vacuum pump pressure	<1x10 ⁻⁵ mbar	
Radiator Cooler temperature	Typical 14°C in ambient and 6°C in TV	
QCM reading	As-is	
History decoder	-	At the end of each ATP or more frequently when necessary w.r.t. file size

Built In test	-	Before OG-start
Other	TBD	

3.9 Back up of DAPB data

The DAPB raw data, i.e. the archived measurements, shall be frequently archived (back-up) on CD-ROM identified with:

- Source (including Gome2 FMx)
- Date/Time
- Made by

The obtained back-up shall be indicated in the logbook.

3.10 Quick Look

Quick look analysis shall be carried out:

- Inspection of DAPB Science Panels before execution of an ATP by dry-run of the ATP
- Inspection of DAPB Science Panels during ATP run
- Using conversion tool off line after execution of ATP

The parameters to be monitored for quick look analysis:

- General insight before/during/after ATP execution
- Signal to noise ratio
- Saturation (<50000 counts, typical 40000)
- Signal (>10000 counts)
- Instrument condition (temperatures, environment etc)

Before a set-up change (ambient to vacuum, OGSE change etc) a successful executed ATP is required.

3.11 LVM monitoring

The SLS internal source is sensitive to operating in Low Voltage Mode (LVM). The following procedure is applicable for monitoring LVM and measuring in LVM mode:

1. After Gome2 has been switched on execute SLS-watchdog.tal
2. Start normal ATP with SLS use:
e.g. SLS-scan.tal and Monitor.tal
3. When LVM behaviour is detected by the watchdog, the running ATP will be suspended (SLS lamp should stay on) and an acoustic signal is generated (automatic activity)
4. Verify that all relevant ATP's have been suspended.
5. Check, using the Macro Command Editor, integration times for sufficient signal/noise ratio for SLS direct and SLS over diffuser (in LVM behaviour). Be sure that the SLS should stay on.
6. Start SLS-LVM.tal, this ATP will measure SLS direct and SLS over diffuser
7. Open CU shutter using Macro Command Editor with DAPB archiver on. Indicate effect on LVM behaviour.

4. Step-by-step procedure

4.1 General

The following shall be taken into account prior and during Calibration Execution (not in order of importance):

	Check
Operation and Handling Procedure [AD1] shall be present	<input type="checkbox"/>
Emergency Procedure [AD4] shall be present	<input type="checkbox"/>
Gome2 safety Procedure [AD9] shall be present	<input type="checkbox"/>
Alignment Procedure [AD5] shall be present	<input type="checkbox"/>
Stand-by operator for TVC and VCF shall be arranged	<input type="checkbox"/>
SMS service for TVC alarm/warnings assigned	<input type="checkbox"/>
Implications of GAL NCR's checked (section 7)	<input type="checkbox"/>
Gome 2 automatic shut off system for TVC pressure installed and tested	<input type="checkbox"/>
Never use PMD coolers = ON during ambient conditions and during -5°C calibration	
QCM software installed for monitoring	<input type="checkbox"/>
Coffee Machine shall be present and working	<input type="checkbox"/>
Log sheets shall be present	<input type="checkbox"/>

It shall be noted that the following step-by-step procedure wr.r.t. the sequence is not mandatory. Measurements order may be changed when convenient.

Date:		Location:		Operator:		PA:	
FM identification:							
No.	Calibration Step-description	Nominal Value	Actual Value	Reference	Remarks	P	N
4.2 preparations							
1.	Arrival of GOME2 EGSE and other equipment	OK					
2.	Unpack EGSE and other equipment	OK					
3.	Incoming inspection	OK					
4.	Install EGSE and other equipment (CTB/DAPB/Pump/Cooler)	OK		[AD1]			
5.	Install sub-network to interconnect all EGSE systems	OK					
6.	Install router	OK			Log IP addresses		
7.	Connect OAC to EGSE-sub network	OK					
8.	Check network performance	OK					
9.	Arrival of Gome2 FM1	OK					
10.	Unpack GOME2	OK		[AD1]			
11.	Inspect GOME2	OK					
12.	Acceptance review	OK			Document in acceptance report		
4.3 Ambient block 1							
13.	Install GOME2 on AETA MGSE	OK		[AD1]			
14.	Mechanical alignment of AETA MGSE	OK		[AD5]			
15.	Connect GOME2 to CTB	OK		[AD1]			
16.	Connect FPA vacuum pump	OK		[AD1]			
17.	Connect Radiant Cooler	OK		[AD1]			
18.	Switch on GOME2	OK		Section 3.5			
19.	Set detector temperature at TD1 and stabilise	OK		Section 3.6	PMD cooling must be OFF!		
20.	Install LRS in front of GOME2, nadir	OK		[AD5]			
21.	Set-up LRS in White Light Mode	OK					
22.	Optical alignment of LRS with respect to GOME2 entrance slit	OK		[AD5]			
23.	MONITOR.TAL	OK		Section 3.7			
24.	AETA.TAL with QTH	OK		Section 3.7			
25.	AETA.TAL with Xe	OK		Section 3.7			
26.	MONITOR.TAL	OK		Section 3.7			
27.	Decision to proceed	OK					
4.4 Ambient block 2							
28.	Shut down GOME2	OK		Section 3.5			
29.	Install GOME2 on AIRR MGSE	OK		[AD1]			
30.	Mechanical alignment of AIRR MGSE	OK		[AD5]			

Date:		Location:		Operator:		PA:	
FM identification:							
No.	Calibration Step-description	Nominal Value	Actual Value	Reference	Remarks	P	N
31.	Connect GOME2 to CTB	OK		[AD1]			
32.	Connect FPA vacuum pump	OK		[AD1]			
33.	Connect Radiant Cooler	OK		[AD1]			
34.	Switch on GOME2	OK		Section 3.5			
35.	Set detector temperature at TD1 and stabilise	OK		Section 3.6	PMD cooling must be OFF!		
36.	Install Sun Simulator in front of GOME2	OK		[AD5]			
37.	Mechanical alignment of Sun Simulator	OK		[AD5]			
38.	Optical alignment Sun Simulator with respect to GOME2 sun port	OK		[AD5]			
39.	AIRR.TAL	OK		Section 3.7			
40.	MONITOR.TAL	OK		Section 3.7			
41.	Decision to proceed	OK					
4.5 Install GOME2 in TVC							
42.	Shut down GOME2	OK		Section 3.5			
43.	Remove GOME2 from MGSE	OK		[AD1]			
44.	Install GOME2 on TVC MGSE	OK		[AD1]			
45.	Install Gome2 in TVC	OK		[AD1]			
46.	Mechanical alignment of MGSE	OK		[AD5]			
47.	Connect GOME2	OK		[AD1]			
48.	Connect FPA vacuum pump	OK		[AD1]			
49.	Connect Radiant Cooler	OK		[AD1]			
50.	Switch on GOME2	OK		Section 3.5			
51.	Install LRS at Nadir window	OK		[AD5]			
52.	Close TVC door	OK		[AD1]			
53.	Check warning/alarm system	OK		[AD4]			
54.	Optical pre-alignment of LRS with respect to GOME2 entrance slit	OK		[AD5]			
55.	Switch Gome2 off	OK		Section 3.5			
56.	Gome2 to vacuum	<10 ⁻⁵ mbar		[AD8]			
57.	Start of Bake-out	30°C		[AD8]			
4.6 TVC/Gome TB2 (nominal temp) campaign							
58.	Start Cool down to TB2			[AD8]			
59.	Switch on GOME2 when temperature has decreased below 303 K	<303K		Section 3.5			
60.	LRS mechanical alignment	OK		[AD5]			
4.6.1 Gome							
61.	Set detector temperature to TD2	OK		Section 3.6			
62.	Set PMD temperature to ground line	OK		Section 3.6			

Date:		Location:		Operator:		PA:	
FM identification:							
No.	Calibration Step-description	Nominal Value	Actual Value	Reference	Remarks	P	N
63.	LINEARITY.TAL	OK		Section 3.7	After stabilisation		
64.	MONITOR.TAL	OK		Section 3.7			
65.	Set detector temperature to TD1	OK		Section 3.6			
66.	Set PMD temperature to flight line	OK		Section 3.6			
67.	LINEARITY.TAL	OK		Section 3.7			
68.	MONITOR.TAL	OK		Section 3.7			
69.	DIFFUSERMON.TAL	OK		Section 3.7	Diffuser monitoring		
4.6.2 LRS in White light mode							
70.	BREWSTERSCAN.TAL with QTH	OK		Section 3.7	Includes ETA/ZETA		
71.	BREWSTERSCAN.TAL with Xe	OK		Section 3.7	Includes ETA/ZETA		
72.	MONITOR.TAL	OK		Section 3.7			
4.6.3 LRS in filter mode (TB2)							
73.	Set-up LRS in filter mode	OK					
74.	FILTER.TAL with Xe	OK		Section 3.7	Dispersion and cross dispersion		
75.	FILTER.TAL with QTH	OK		Section 3.7	Dispersion and cross dispersion		
76.	MONITOR.TAL	OK		Section 3.7			
4.6.4 LRS in slit mode (TB2)							
77.	Set-up LRS in slit mode	OK					
78.	IFOV.TAL with Xe	OK		Section 3.7			
79.	MONITOR.TAL	OK		Section 3.7			
4.6.5 LRS in monochromator mode (TB2)							
80.	Set-up LRS in monochromator mode	OK					
81.	MONOSCAN.TAL with Xe	OK		Section 3.7	For straylight		
82.	MONOSCAN.TAL with QTH	OK		Section 3.7	For straylight		
83.	MONITOR.TAL	OK		Section 3.7			
84.	Decision to proceed	OK					
4.6.6 HCL stimulus (TB2)							
85.	Set-up HCL stimulus	OK					
86.	HCL.TAL	OK		Section 3.7	For FPA wavelength calibration		
87.	MONITOR.TAL	OK		Section 3.7			
4.6.7 ORIEL stimulus (TB2)							
88.	Set-up Oriel stimulus	OK					
89.	ORIEL.TAL	OK		Section 3.7	For PMD wavelength calibration		
90.	MONITOR.TAL	OK		Section 3.7			

Date:		Location:		Operator:		PA:	
FM identification:							
No.	Calibration Step-description	Nominal Value	Actual Value	Reference	Remarks	P	N
4.6.8 Zenith sky measurements (TB2)							
91.	Install Zenith Sky set-up	OK		[AD5]			
92.	Optical alignment of Zenith Sky set-up	OK		[AD5]			
93.	ZENITH.TAL	OK		Section 3.7			
94.	MONITOR.TAL	OK		Section 3.7			
95.	Decision to proceed	OK					
4.6.9 Rad/Irrad in sun mode (TB2) and Sun simulator at nadir (TB2)							
96.	Install Rad/Irrad Set-up	OK		[AD5]			
97.	Setup Rad/Irrad in Sun mode	OK		[AD5]			
98.	Align Rad/Irrad Set-up in Sun mode	OK		[AD5]			
99.	Install Sun Simulator	OK		[AD5]			
100.	Set-up Sun Simulator at Nadir window	OK		[AD5]			
101.	Align Sun Simulator	OK		[AD5]			
102.	FELRAD.TAL	OK		Section 3.7			
103.	MONITOR.TAL	OK		Section 3.7			
104.	SUNRAD.TAL	OK		Section 3.7			
105.	Decision to proceed	OK					
4.6.10 Rad/Irrad in nadir mode (TB2) and Sun simulator at sun (TB2)							
106.	Set-up Rad/Irrad in Nadir mode	OK		[AD5]			
107.	Align Rad/Irrad Set-up in Nadir mode	OK		[AD5]			
108.	Set-up Sun Simulator at Sun window	OK		[AD5]			
109.	Align Sun Simulator	OK		[AD5]			
110.	FELIRR.TAL	OK		Section 3.7			
111.	MONITOR.TAL	OK		Section 3.7			
112.	SUNIRR.TAL	OK		Section 3.7			
113.	Decision to proceed	OK					
4.6.11 Sphere in nadir (TB2)							
114.	Install TVSPH in front of Nadir window			[AD5]			
115.	Align TVSPH with respect to GOME2 entrance slit	OK		[AD5]			
116.	SPHERE_TAL	OK		Section 3.7			
117.	MONITOR.TAL	OK		Section 3.7	Including SLS over diffuser		
118.	Decision to proceed	OK					
4.7 TVC/Gome TB1 (nominal-10 temp) campaign							
119.	Switch off PMD cooling	OK			During -10 campaign no PMD cooling is allowed!		
120.	Change TB temperature and stabilise	OK					
121.	Install LRS	OK		[AD5]			
122.	Optical pre-alignment of LRS with	OK		[AD5]			

Date:		Location:		Operator:		PA:	
FM identification:							
No.	Calibration Step-description	Nominal Value	Actual Value	Reference	Remarks	P	N
	respect to GOME2 entrance slit						
123.	Optical alignment (check + fine-tuning) of LRS with respect to GOME2 entrance slit	OK		[AD5]			
4.7.1 LRS in white light mode (TB1)							
124.	Set-up LRS in White light mode	OK					
125.	BREWSTERSCAN.TAL with QTH	OK		Section 3.7	Eta/Zeta only		
126.	BREWSTERSCAN.TAL with Xe	OK		Section 3.7			
127.	MONITOR.TAL	OK		Section 3.7			
4.7.2 Oriel stimulus (TB1)							
128.	Set-up Oriel Monochromator	OK					
129.	ORIEL.TAL	OK		Section 3.7			
130.	MONITOR.TAL	OK		Section 3.7			
4.7.3 HCL stimulus (TB1)							
131.	Set-up HCL stimulus	OK					
132.	HCL.TAL	OK		Section 3.7			
133.	MONITOR.TAL	OK		Section 3.7			
134.	Decision to proceed	OK					
4.7.4 Rad/Irrad in sun mode (TB1) and Sun simulator at nadir (TB1)							
135.	Install Rad/Irrad Set-up	OK		[AD5]			
136.	Set-up Rad/Irrad in Sun mode	OK		[AD5]			
137.	Align Rad/Irrad Set-up in Sun mode	OK		[AD5]			
138.	Install Sun Simulator	OK		[AD5]			
139.	Set-up Sun Simulator at Nadir window	OK		[AD5]			
140.	Align Sun Simulator	OK		[AD5]			
141.	FEL_ABS.TAL	OK		Section 3.7			
142.	MONITOR.TAL	OK		Section 3.7			
143.	SUSI.TAL	OK		Section 3.7			
4.7.5 Rad/Irrad in nadir mode (TB1) and Sun simulator at sun (TB1)							
144.	Set-up Rad/Irrad in Nadir mode	OK		[AD5]			
145.	Align Rad/Irrad Setup in Nadir mode	OK		[AD5]			
146.	Set-up Sun Simulator at Sun window	OK		[AD5]			
147.	Align Sun Simulator	OK		[AD5]			
148.	FEL_ABS.TAL	OK		Section 3.7			
149.	MONITOR.TAL	OK		Section 3.7			
150.	SUSI.TAL	OK		Section 3.7			
151.	Decision to proceed	OK					
4.8 TVC/Gome TB3 (nominal+10 temp) campaign							
152.	Change TB temperature and stabilise	OK					

Date:		Location:		Operator:		PA:	
FM identification:							
No.	Calibration Step-description	Nominal Value	Actual Value	Reference	Remarks	P	N
153.	Switch on PMD cooling	OK					
154.	Install LRS	OK		[AD5]			
155.	Optical pre-alignment of LRS with respect to GOME2 entrance slit	OK		[AD5]			
156.	Optical alignment (check + fine-tuning) of LRS with respect to GOME2 entrance slit	OK		[AD5]			
4.8.1 LRS in white light mode (TB1)							
157.	Set-up LRS in White light mode	OK					
158.	BREWSTERSCAN.TAL with QTH	OK		Section 3.7	Eta/Zeta only		
159.	BREWSTERSCAN.TAL with Xe	OK		Section 3.7			
160.	MONITOR.TAL	OK		Section 3.7			
4.8.2 HCL stimulus							
161.	Set-up HCL stimulus (TB3)	OK					
162.	HCL.TAL	OK		Section 3.7			
163.	MONITOR.TAL	OK		Section 3.7			
164.	Decision to proceed	OK					
4.8.3 Oriol stimulus (TB3)							
165.	Set-up oriel Monochromator	OK					
166.	ORIEL.TAL	OK		Section 3.7			
167.	MONITOR.TAL	OK		Section 3.7			
4.8.4 Rad/Irrad in sun mode (TB3) and Sun simulator at nadir (TB3)							
168.	Install Rad/Irrad Set-up	OK		[AD5]			
169.	Set-up Rad/Irrad in Sun mode	OK		[AD5]			
170.	Align Rad/Irrad Set-up in Sun mode	OK		[AD5]			
171.	Install Sun Simulator	OK		[AD5]			
172.	Set-up Sun Simulator at Nadir window	OK		[AD5]			
173.	Align Sun Simulator	OK		[AD5]			
174.	FELRAD.TAL	OK		Section 3.7			
175.	MONITOR.TAL	OK		Section 3.7			
176.	SUNRAD.TAL	OK		Section 3.7			
4.8.5 Rad/Irrad in nadir mode (TB3) and Sun simulator at sun (TB3)							
177.	Set-up Rad/Irrad in Nadir mode	OK		[AD5]			
178.	Align Rad/Irrad Setup in Nadir mode	OK		[AD5]			
179.	Set-up Sun Simulator at Sun window	OK		[AD5]			
180.	Align Sun Simulator	OK		[AD5]			
181.	FELIRR.TAL	OK		Section 3.7			
182.	MONITOR.TAL	OK		Section 3.7			
183.	SUNIRRTAL	OK		Section 3.7			

Date:		Location:		Operator:		PA:	
FM identification:							
No.	Calibration Step-description	Nominal Value	Actual Value	Reference	Remarks	P	N
184.	Decision to proceed	OK					
4.9 CATGAS measurements at TB2							
185.	CATGAS measurements				Procedure TBW		
4.10 Post test and packing							
186.	Perform functional test	OK					
187.	Shut down GOME2	OK		Section 3.5			
188.	Pack GOME2 instrument EGSE and other equipment	OK		[AD1]			
189.	Post Test Review (PTR)	OK					

4.11 Non-conformance Reporting

In failure cases, non-conformance reporting shall follow prescriptions of the Product Assurance Plan.

4.12 Deviations from the Procedure

Deviations are acceptable as long as test purposes and objectives remain valid. In any case deviations need to be introduced via the "Procedure Variation Sheet". A form sheet is provided in section 6.

Where a non-conformance was the reason for a procedure deviation, a non-conformance report needs to be generated separately.

5. Procedure sign-off sheet

The identified test article has been successfully calibrated in accordance with this procedure and all open items and non-conformance reports are closed except those listed here below:

Date and signatures of:

Test Manager:

Product Assurance:

Customer:

6. Procedure Variation Sheet

	TNO-TPD	Procedure Variation Sheet				Procedure No. Date Issue: Sheet PVS No.
	Project: Gome-2 Instrument Calibration					
Cal Step No.	Test Step description	Nominal Value	Actual Value	P	N	Remarks
	Date:	Test Location:	Operator:	PA:	Customer:	

7. Gome 2 NCR's affecting Calibration Execution (GAL info)

This information shall be obtained from GAL